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December 11, 2018

Sara Hertz Wu
Erin Weekley
EPA Region VII
11201 Renner Boulevard
Lenexa, Kansas 66219

Re: Documentation of Completion of Compliance Actions

Dear Sara and Erin:

Through this letter and the enclosed attachments, Big Ox Energy – Siouxland, LLC ("BOE") is submitting the documentation of its completion of compliance actions as required by Paragraph 70 of the Administrative Order for Compliance on Consent ("AOCC"). Attached as **Exhibit A** is a chronology of the major submissions and calls in which BOE worked to provide EPA with updates and plans on its successful implementation of the actions in the AOCC. Attached as **Exhibit B** is a summary of the completed actions, repairs and improvements that were successfully implemented by BOE (or are in the process of being implemented) to comply with the AOCC. Attached as **Exhibit C** is a summary of BOE's Emergency Action Plan ("EAP") and Related Procedures that are implemented by BOE through its well-established communication channels to notify and work with the BOE work force and with the local Emergency Providers in the event there is a future substantial release or spill. Attached as **Exhibit D** is a summary which addresses the Procedures that BOE and its subcontractors developed back in July to address NDEQ's concerns with applying Dry Products, such as lime.

As we discussed on our last call on November 29th and my follow up call with Sara on December 7th, the AOCC is silent on the format and content of what information BOE is expected to submit to document its completion of its compliance actions. The individual AOCC provisions (in Paragraph 65 through 70) that create the compliance actions generally direct BOE

to evaluate and remedy an issue or process based on the technical solutions and plans that would be developed.

When EPA issued its September 7th Notice of Violation ("NOV") and the draft AOCC to BOE, EPA had not conducted an on-site inspection of BOE's operations or processes since February 14, 2017. As we discussed, the AOCC provided BOE with substantial flexibility to develop and implement appropriate remedies, improvements, and solutions as a result of the knowledge that would evolve (and the technical gaps that would be filled) through the following considerations and factors:

1. In drafting the AOCC (and the related August 6th and October 11th Information Requests), EPA's primary and immediate objective was setting up the interim monitoring programs, which BOE expeditiously started to implement on August 17th with the installation of BOE's portable monitors. EPA's primary objective has been accomplished through BOE's installation of its two permanent fenceline monitors on November 27th. The primary gap that BOE has filled is demonstrating that ambient levels of H_2S at the fenceline do not pose a safety risk to workers or the public and do not exceed Nebraska's ambient limit of Total Reduced Sulfur ("TRS") based both on a 30-minute and a one-minute averaging period. As summarized in **Exhibit B**, the monitoring generated so far by BOE indicates that the ambient levels of H_2S and Methane at its fenceline are well below EPA's thresholds set forth in the AOCC in Paragraph 65(b)(iii).

2. In our frequent e-mails and conference calls over the last few months, as we implemented the staggered terms in the AOCC, EPA recognized that BOE would require additional lead time to identify and retain outside engineers and consultants to first develop and then implement well-supported and integrated remedial plans and improvement. EPA and BOE specifically recognized that there were not ready-made "off the shelf" solutions. Instead, BOE needed to develop solutions that carefully balanced competing concerns to ensure the safe implementation of its work-procedures. Over the last two months, BOE and its contractors have been successful in

implementing solutions through our iterative process and through the helpful ongoing input from the EPA team and BOE's experts and consultants.

* * *

BOE will supplement this submission with the updates on ongoing activities noted in the enclosed summaries. Based on my December 7th call with Sara, BOE will respond in 10 days with an update on the status of a proposed plan addressing the wall-joint on the AD #2 roof. See Exhibit B – Paragraph 65(a)(ii).

Please contact me with any questions or concerns. We would welcome setting up a status-conference call at your convenience.

Best regards,

William M. Guerry

cc: Bill Tyndall
Michael Major

Enclosures

EXHIBIT A
BOE's Implementation of AOCC Provisions with the Repairs to the AD Roofs and Mixers

Chronology of Submissions and Calls with EPA

I. Release Report and Subsequent Revisions to Report

a. On September 28th, BOE/Mike Major submitted the initial listing of permitted emission points, pursuant to Par. 65 (a)(vi)

b. BOE/Mike Major submitted revised and updated release reports on October 9th and on October 30th as noted below.

II. Repairs for the Mixer #2 Draft Tube and Blind Flange

a. On October 22nd, Bill Guerry sent to EPA BOE's Proposed Repair Plan for the AD Roofs and the related actions undertaken to implement Par. 65(a)(1) and (a)(8) of the AOCC.

b. Attached to the Repair Plan were the specific proposals to repair the Mixer #2 of the AD #1. BOE explained that the national design/build firm Miron had developed solutions to correct the sealing and cracking concerns with both the repairs to the expansion joint and Mixer #2. BOE also explained that McMahon Engineering, who had been the original architect on the project, was involved in preparing the engineering and work plans for these repairs.

c. BOE and EPA had a conference call on October 22nd to discuss the Proposed Repair Plans, including the safety procedures that would apply to the Mixer #2 repair to the Draft Tube and Blind Flange.

d. On October 23rd, BOE submitted supplemental information on the tailored Job Safety Procedure and Forms, per EPA's request on the October 22nd call.

e. On October 30th, BOE submitted written confirmation to EPA with photographs documenting that the Mixer #2 sealing enclosure had been successfully implemented.

   i. BOE also confirmed that it had replaced a vulnerable gasket on the gas cleanup Skid dryer, and verified that seal's effectiveness

   ii. Both of the successful improvements identified above were captured in a revised submission of the release point summary report.

III. Repair Plan for the AD #2 Roof Joint Crack

a. The October 22nd email cited above included a summary of the proposed repairs of the roof of the AD.

b. On November 2nd, BOE submitted detailed engineering drawing prepared by McMahon Engineering to further supplement the proposed prior Repair Plan for the AD #2 roof, pursuant to Par. 65 (a)(iii).

   1. BOE explained that Midwest Mobile Waterjet would be removing the joint on AD #2, and that Spectrum Coatings would be involved in filling the joint on the AD roof with their engineered epoxies.

   2. BOE also explained that it had been working with Peterson Engineering, who had developed the new replacement bladder structure.

c. On November 2nd, the BOE and EPA legal and technical teams had an extended conference call to review the repair plans for the AD #2 roof.

d. On November 9th, Bill Guerry called Sara Hertz Wu to brief her on the successful implementation of the AD Roof remedy that was completed on November 7th. During the week of November 14th, Bill Guerry orally provided Sara Hertz Wu on calls with updates of the successful implementation of the repair plan.

e. On November 29th, comprehensive call with the EPA and BOE legal and technical teams on the implementation of all the provisions in the AOCC, including a discussion of evaluating the AD roof to ensure the permanent sealing

f. On the November 29th call, BOE also provided a full report on the status of sealing the Mixer 2 port, as well as providing confirmation that all the other mixers were fully operational.

IV. Installation of Permanent Fenceline H_2S Monitors

a. On November 27th, BOE installed the two fenceline monitors and began submitting continuous emissions data to EPA on December 4th, pursuant to Paragraph 66 of the AOCC.

b. The data generated so far through the fenceline continuous monitors confirms that the emissions from the BOE plant are well-below Nebraska's instantaneous and 30-minute limits for Total Reduced Sulfur ("TRS") in the ambient air of BOE's fenceline.

EXHIBIT B
BOE's Documentation of Completing Compliance Actions under Paragraph 70 of AOCC

65a-(i)- AD Roof Repairs- BOE successfully sealed/repaired the AD#1 mixer #2 port and expansion joint tear on AD #2 and continues to identify, monitor and address smaller leaks.

a. AD#1 Mixer #2 repair

1. The AD#1 Mixer #2 draft tube was entrained in the AD#1 solid layer and prevented Mixer #2 operation. As the AD#1 solid layer shifted, the AD#1 Mixer #2 draft tube moved and compromised the roof top seal. BOE constructed a temporary sealing structure over the Mixer #2 motor and roof interface.

BOE and its contractor staff reduced the digester's headspace gas pressure to minimize release during the repair and set the flare operating thresholds to maintain active flaring at the reduced pressures.

BOE and its contractor staff completed the service in one day and did not have to install roof rigging or other trusses to remove Mixer 2. BOE staff placed a flange gasket and cover over the remaining perforation and verified a hermetic seal with handheld monitors.

BOE used handheld monitoring as an additional diagnostic device, to ensure staff safety during the repair.

Please see *181022_Draft Tube Removal Procedure.pdf*

65a-(ii)- AD #2 Expansion Joint Tear Repair -BOE staff and contractors developed and executed a tailored repair of a transverse seam leak on the roof of AD#2. BOE and its contractors inserted a balloon, inflated the balloon (to seal AD #2 during the repair operation) and repaired the roof and roof membrane. (See *Big Ox SSC Expansion Joint Repair drawings.pdf*).

BOE used handheld monitoring as an additional diagnostic device, to ensure staff safety during the repair. (See *181016_balloon_repair_plan.pdf*).

BOE and its contractors not only completed AD #2 expansion joint repair but also established work procedures to detect and repair other similar vulnerabilities.

On November 7th, after the completion of the repair of the roof seam, BOE used a handheld probe to sample air within 6 inches along the entire 42 feet of the repaired seam. As presented in attachment *TimeWise_dls_Report.pdf*, the sampled air generated 34 data points over a period of 5 minutes for the following parameters: H_2S, Methane, Oxygen, and CO_2. Thirty-two of the thirty-four data points to measure for H_2S above the repaired seam were below detection levels. The two readings above detection levels were 3.1 and 0.7 ppm of H_2S.

BOE has confirmed that those two very low measurements were emissions from the AD joint with the wall and not from the roof expansion joint-seam. BOE will submit a status update by December 20th on the repair of the wall-joint.

65a-(iv)-PRVs- BOE is in ongoing communication with the PRV manufacturer, Groth Corporation, to evaluate options for improving actuation-detection and is considering direct contact sensing. BOE is also improving the existing, upstream pressure sensor performance by installing insulation and heating elements.

65a-(v)-Process Instrumentation- AD1 Mixer #2 port has been successfully sealed to prevent the release of biogas from the digester. BOE is evaluating the relocation of the pH/temperature probes for process monitoring of AD1 and AD2 with HACH. Product recommendation and quote shall be received by 12.14.2018 by HACH. All necessary process monitoring related to the non-functioning equipment is being collected and analyzed by facility operations/laboratory staff.

65a-(vi)-Release Points- BOE provided EPA with an initial Release Reports, providing a list of known release points at the facility, on October 09. During the roof and mixer repairs, BOE identified further potential release points which it provided in an updated Release Report on October 25. BOE includes in this communication, a further update *181025_Release_summary_report.xlsx*.

65a-(vii)-Release Points- BOE has eliminated all known, unpermitted release points at the site listed in the Release Report with the exception of the small roof release point as identified in R18C6 of *181025_Release_summary_report.xlsx*. BOE is in the process of working with experts to develop a schedule and repair plan for the remaining AD#2 roof release point which will be submitted to EPA by December 20, 2018.

65a-(viii)(1)-Mixture Releases- BOE has previously provided documentation as well as a briefing for EPA regarding the successful repair and permanent replacement of the temporary cap over the location of Mixer 2. Following this successful repair, there are no known biogas release points associated with the facility's mixers.

65a-(viii)(2)-Mixer Repairs- BOE has engaged in extensive discussions with the manufacturer of Mixer 2 and is currently evaluating repair and replacement options as well as the feasibility of continued operations without Mixer 2.

65b-(i)- PRV Release Points- BOE is minimizing the possibility of pressure relief valve ("PRV") actuation through improved control of digester operating parameters, implementing early warning triggers (based on headspace gas pressure) and improving PRV actuation determination. BOE is improving the existing "PT" series pressure sensors (which monitor PRV conditions) with insulation and heating

If feasible, BOE will install PRV micro-switches on the PRV discharge orifice to positively determine plate movement.

65(b)-(ii) and (iii)- On November 19th, the BOE Safety Director supplemented BOE's Emergency Action Plan (EAP) to incorporate the provisions in Paragraph 65(b)(iii). BOE continues to work with the local First Responders to fully integrate the additional new monitoring data with the well-established and integrated communication channels and local emergency response procedures. (See Exhibit C).

66-Permanent Monitors- BOE installed and is successfully operating two permanent fenceline monitors on November 28th. BOE started and continues submitting the continuous data from those additional monitors on December 4th.

BOE and its consultant, Dr. Sahu, are working with the manufacturer-supplier of the CEMS on developing a comprehensive monitoring plan per the discussion on the EPA/BOE call on November 29th.

BOE plans to add into that plan the additional CEMS sensor at the inlet to the Skid and submit that complete monitoring plan by December 20th pursuant to BOE's December 7th Response to EPA's October 11th Information Request.

67- Pre-Flare H_2S CEMS Monitor— In the AOCC EPA required BOE to install the H_2S monitor prior to the flare, pursuant to the NDEQ Air Permit—within 45 days of the effective date of this Order. (See Par. 68). In the NDEQ current Air Permit (that was issued in April), BOE agreed after

an extensive technical dialogue to install the H_2S CEMS prior to the flare (EP06), pursuant to the NDEQ Permit Condition III(A)(3)(i). BOE submitted the purchase order for the Meg Tec CEMS on June 20th, 2018, so that the CEMS could be installed in early November. In fact, BOE paid a 50% ($105,000) down payment to Meg Tec on July 25th. However, BOE has been waiting to install that H_2S CEMS because of the ongoing dialogue with EPA on implementing the EPA direction in its October 11th Information Request to monitor H_2S emissions from the nearby skid (EP07) tail gas exit. This has been an iterative and complex challenge, in which EPA and BOE have recently reached the following conditional agreement:

1. BOE will install CEMS at two discrete locations – preceding the EP06 supply line and immediately after the media scrubber discharge supplying EP07. Both CEMS will separately monitor H_2S emissions.
2. BOE proposes to install the CEMS at EP06 and EP07 supply by March 7, 2019. (See *181207_BOE Response to Oct 11 IR final.docx*).

BOE will continue to work with the Permit team at NDEQ on the installation, calibration, and operation of the CEMS and sensor upstream of the flare, pursuant to all the terms and conditions in the NDEQ Air Permit. BOE will continue to update EPA on the CEMS installation.

68- Evaluation of Flare- BOE is working with Pace Analytical to generate formal quote and dates scheduled for the flare testing to be completed before December 31, 2018. (See *Pace Analytical Quote SSC 2018.pdf*). BOE will continue to provide EPA with updates.

69- Dry Products Application See attached Exhibit D.

EXHIBIT C
BOE's Implementation of its Response Plan under Paragraph 65(b)(ii)-(iii)

BOE is working with Dakota County and South Sioux City to supplement BOE's reporting and notification plan for the inclusion of the new fenceline monitoring for ambient air emissions, which have been incorporated into BOE's existing Emergency Action Plan (EAP). BOE's Emergency Action Plan (as modified pursuant to the AOCC on November 19th) includes extensive provisions requiring BOE to: (1) Immediately assess a chemical spill or toxic gas release; (2) notify the Emergency Response Coordinator; and (3) implement Response Procedures and Emergency Actions and Contingency Plans, potentially including evacuations of workers from the area at the plant based on specific thresholds. Pursuant to Paragraph 65(b)(iii) of the AOCC, BOE must call the local emergency response providers any time that H_2S levels are expected to exceed 50 ppm at the fenceline or when methane or biogas levels are expected to exceed 10% of the LEL at the fenceline. (See *BOE Siouxland Emergency Action Plan 2018.docx* at pp. 4-6).

So that the affected local emergency experts and first responders are best prepared on the potential risk from both H_2S and biogas that could potentially be emitted from BOE, BOE undertakes proactive steps to "work cooperatively within the framework of the Dakota County Local Operations Plan and the South Sioux City Emergency Response Plan." (See *BOE Siouxland Emergency Action Plan 2018.docx* at p. 5). As part of its ongoing education outreach, BOE will provide notification to the local fire department and first responders so that they are knowledgeable about the improvements to the fenceline monitoring systems at BOE, and that they are aware of BOE's obligations to notify those first responders in the event of a triggering event above the H_2S or LEL thresholds. Desiree McCaslen will be the local BOE delegate responsible for these communications.

BOE provides notices of such releases through the well-established programs and procedures that have been adopted in the Local Emergency Operations Plan ("LEOP"), adopted for Dakota County, Nebraska. The main components of that plan are attached from the Dakota County LEOP. That plan creates numerous systems, under which the appropriate designated local officials are charged with the legal authority and duty to promptly contact the affected public (including residential neighbors, when that local authority determines it is appropriate based on its expertise and the notification summarized below.)

The Dakota County LEOP establishes the chain of communications and warnings between the affected local entities, including public works, the fire department, and the police. (See *Dakota County LEOP – [various]*). These include the following actions and procedures:

- A responsible facility like BOE must immediately provide the incident notification to all the designated local response organizations, which typically is responsible for "coordinating and establishing a command post at the scene" and for "planning for possible in-place-shelter or evacuation of buildings or areas involved."
- Emergency Procedures ensure the rapid dissemination of emergency public information, including the use of media resources, such as public television and radio stations.
- Planning guidance and structures for implementing a timely and orderly evacuation in those extraordinary cases that there is an evacuation decision by the local authorities.

BOE has a close working relationship with the South Sioux City Fire Department, which is responsible for providing hazmat training and directing and controlling any evacuations. Based on local input, the Local Emergency Planning Committee ("LEPC") has developed well-established existing plans to identify and coordinate the local response to an incident involving the potential release of hazardous materials. (See *Dakota County LEOP - Hazardous Materials Response.pdf*). The plans developed by the LEPC include "providing information to citizens of the district on the hazardous substances stored and used in their neighborhoods." Finally, the Dakota County Emergency Management Agency is responsible for "coordination and notifying the public of evacuation areas or other health and protective measures." (See *Dakota County LEOP – Evacuation.pdf*).

EXHIBIT D
Application of Dry Products Pursuant to Paragraph 69 of AOCC

The AOCC includes a provision that BOE must develop "a written procedure for employees and contractors regarding the application of dry products outdoors." (See Par. 69 of AOCC). BOE and its subcontractors continues to implement the Application-Procedures that were developed pursuant to the chronology and process summarized below. We suggest involving NDEQ to confirm that BOE has also addressed their concerns, given that NDEQ first identified this concern.

On August 16th, 2018, NDEQ issued an NOV, which alleged that as part of NDEQ inspections in the first half of August 2018, "dust from the site cleanup at BOE was airborne in such quantities and concentrations that it remained visible in ambient air beyond the property line." As the basis for this allegation, NDEQ cited to general narrative provisions in the NDEQ Air Permit requiring BOE to control dust, so that it did not leave the property boundaries.

Below is the factual background that resulted in the use of the affected dry products.

1. On June 22nd, 2018, NDEQ issued its Emergency Complaint and Order to BOE. That order was primarily issued under the authority provided by the state Stormwater Permit that NDEQ had issued to BOE, as well as Nebraska authority to protect land and water pollution associated with a spill or release of unpermitted wastewaters.
2. In its Emergency Order, NDEQ directed BOE to clean up the entirety of the release waste, including all impacted areas of respondents' facility and property, building surfaces exposed to stormwater, and off-property discharges. The focus of the NDEQ emergency order was to control the sludge and wet materials, and facilitate their removal in a practical and effective manner. BOE has successfully implemented all the provisions and objectives of NDEQ's Emergency Order.
3. In early July 2018, in order to comply with NDEQ's Emergency Order, BOE retained the outside consultant Envirocon to develop and implement the response and clean-up for the foaming event, which had occurred in June.
4. To practically remedy the release of BOE's sludge, Envirocon's July 3rd 2018 proposal noted that: "if this material [the sludge spilled outside] has a moisture

content that does not allow heavy equipment to move the material, Envirocon will solidify this biomass material in-place, using lime pellets, fly ash, or other pozzolanic reagents." (See *Envirocon work plan.pdf*, page 5).

Below is a summary of the procedures that BOE and its subcontractors apply to control dry products.

1. Whenever BOE develops a work plan to control significant external cleanups involving the application of dry products, BOE requires the contractors and the BOE employees to develop and implement "Erosion and Dust Control Measures." (See *Envirocon work plan.pdf* p. 1, dated July 3rd).
2. In its enclosed work plan, Envirocon (at BOE's request) included a specific precautionary "Section 5.0" on "SWPPP and Dust Control." That section noted that "dust control will be critical," and stated that: "Envirocon will utilize a 2,000-gallon water truck, tooled with spray bars and a fire hose, to reduce the dust on this project. A BOE provided onsite water source will keep the truck full at all times." (See *Envirocon work plan.pdf*, pp. 9-10).
3. BOE has codified the language cited above so that if BOE or its subcontractors ever has to conduct a major spill or cleanup that would again require the application of dry, absorbent material to sludge spilled outside, then BOE personnel will ensure that both its employees, and the affected contractors comply with the fugitive dust-generic conditions in BOE's Air Construction Permit.
5. In particular, BOE will ensure as part of any ongoing or future remedial activity, that its employees and its outside contractors are trained to utilize the water truck with the spray bars and fire hose to reduce dust from the roads, as summarized above.

BOE is working with NDEQ to resolve all the allegations in NDEQ's August 16th NOV, including the fugitive dust NOV, which is solely based on emissions of particulate matter, and not to any "hazardous substance" (that would be subject to EPA's jurisdiction under 112(r) of the Clean Air Act). Moreover, the fugitive discharges of dust have no impact on EPA's secondary concern with the Nebraska ambient air quality standard for TRS.